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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,028	10/31/2003	David Sikharulidze	1509-467	7131

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/698,028	SIKHARULIDZE, DAVID	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-27* is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/02/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/02/06 has been entered.

Affidavit

2. The affidavit under 37 CFR 1.132 filed 06/02/06 is sufficient to overcome the rejection of claims 1-16 based upon Eguchi as the primary reference.

New Rejections

Double Patenting

3. Claims 1-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7-27 of copending Application No. 11/075,255. Although the conflicting claims are not identical, they are not patentably distinct from each other. Opposite directions of an electric field have polarities which are opposite to each other. Furthermore, a DC pulse is equivalent to a pulse of a unidirectional electric field.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 1-27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10, 13, 16-17 of copending Application No. 11/114, 449. Although the conflicting claims are not identical, they are not patentably distinct from each other. Opposite directions of an electric field have polarities which are opposite to each other. Furthermore, a DC pulse is equivalent to a pulse of a unidirectional electric field.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-6, 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durand (US 5,357,358) in view of Eidenschink (US 5,729, 320).

Regarding claims 1-3, 5-6, 9-13, Durand teaches a bistable liquid crystal display device (optical, abstract) comprising two cell walls (transparent plates 12, 14, abstract, Fig. 1) enclosing a layer of a composition comprising nematic liquid crystal (20, abstract, Fig. 1), at least one of said cell walls being translucent (deposition of a polymer on the internal facing surfaces of the transparent plates, followed by abrasions of the polymer, column 6, lines 34-36); at least one electrode on each side of said cell walls for applying

an electric field across at least some of said liquid crystal (control electrodes 18, 19, abstract, Fig. 1); a first surface alignment on an inner surface of one of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a first orientation, and a second surface alignment on an inner surface of the other of said cell walls for inducing adjacent molecules of said liquid crystal to adopt a second orientation which is different from said first orientation (two abrasions of the polymer which are inclined to each other, column 6, lines 33-40, liquid crystal oriented planar on the upper plate 12, oblique on the lower plate 14); said nematic liquid crystal material being arranged so it has a first stable molecular configuration in response to a first unidirectional electric field of a first direction and suitable magnitude and duration being applied across said electrodes and a second stable molecular configuration in response to a second unidirectional electric field of a second direction and suitable magnitude and duration being applied across said electrodes, said second configuration being different from said first configuration, the first and second directions being opposite to each other (two stable configurations of the molecules of the liquid crystal material generating opposite flexoelectric polarizations, column 5, lines 20-24, positive pulse applied to cell, field promotes creation of second configuration, in order to pass back into the first configuration, apply a negative pulse to the cell, column 6, lines 11-26). Durand fails to teach finely divided solid particles dispersed in the composition comprising nematic liquid crystal material, wherein the solid particles are capable of triboelectric charging or acquiring charge in suspension in a liquid crystal material, let alone that they have a size in the range of 1 to 1000 nm, or 5 to 50 nm, or that they comprise silica, alumina,

titanium dioxide particles, or are present in a concentration of from 0.1% to 25% or from 1% to 15%, or from 1% to 5% by weight of said composition.

However, Eidenschink teaches a bistable liquid crystal display device (generating bistable images, column 2, lines 7-10, liquid crystalline medium in a display, column 2, lines 23-29) comprising nematic liquid crystal material (phase, column 7, lines 34-36) and finely divided solid particles dispersed therein, which are selected from silica, alumina, titanium dioxide (Aerosil 200, column 7, lines 34-35, highly disperse metal oxides by Aerosil, Degussa, aluminum oxide, titanium oxide, column 4, lines 53-60), present in a concentration of around 4% ([0.1g + 0.3g]*100/[0.1g + 0.3g + 10g], column 7, lines 34-35), which is within the claimed range of from 0.1% to 25% or from 1% to 15%, or from 1% to 5% by weight of said composition, having a particle size of 12 nm (column 6, lines 54-55) and 16 nm (column 7, lines 9-10), which are within the claimed range of 1 to 1000 nm, or 5 to 50 nm, and capable of triboelectric charging or acquiring charge in suspension in a liquid crystal material, as defined by Applicant's specification (page 20, section [0044]). Eidenschink teaches that the composition provides bistability of the transparent and the scattering state for nematic liquid crystal (column 2, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the composition comprising nematic liquid crystal material with finely divided solid particles comprising silica, alumina, titanium dioxide particles, capable of triboelectric charging or acquiring charge in suspension in a liquid crystal material, have a size in the range of 1 to 1000 nm, or 5 to

50 nm, and present in a concentration of from 0.1% to 25% or from 1% to 15%, or from 1% to 5% by weight of said composition, in order to provide bistability of the transparent and the scattering state for the nematic liquid crystal composition of Durand, as taught by Eidenschink.

Regarding claim 4, Durand teaches drive electronics for applying the unidirectional electrical fields to the electrodes (electrical supply means for applying to the device pulses of electric field perpendicular to the plates and oriented selectively in one direction or the other, column 14, lines 38-42).

Regarding claim 14, Durand teaches a polarizer for distinguishing between different optical states of said liquid crystal material (cell is observed between polarizers, column 6, lines 6-10).

Regarding claim 15, Durand fails to teach that the liquid crystal has a pleochroic dye dissolved therein.

However, Eidenschink teaches that the liquid crystal has a pleochroic dye dissolved therein (dichroic, column 3, lines 61-62), for the purpose of providing a multi-colored display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the liquid crystal of Durand with a pleochroic dye dissolved therein, in order to provide a multi-colored display, as taught by Eidenschink.

Regarding claim 16, Durand teaches a bistable liquid crystal display device (optical, abstract) comprising two cell walls (transparent plates 12, 14, abstract, Fig. 1)

enclosing a layer of a composition comprising nematic liquid crystal (20, abstract, Fig. 1), at least one of said cell walls being translucent (deposition of a polymer on the internal facing surfaces of the transparent plates, followed by abrasions of the polymer, column 6, lines 34-36); at least one electrode on each side of said cell walls for applying an electric field across at least some of said liquid crystal (control electrodes 18, 19, abstract, Fig. 1); a first surface alignment on an inner surface of one of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a first orientation; a second surface alignment on an inner surface of the other cell wall for inducing a second orientation which is different from said first orientation (two abrasions of the polymer which are inclined to each other, column 6, lines 33-40, liquid crystal oriented planar on the upper plate 12, oblique on the lower plate 14); a structure for distinguishing between different optical states of said liquid crystal (cell formed is observed between analyzers and polarizers, column 6, lines 6-10); and drive electronics connected to said electrodes (electrical supply means are connected between the electrodes provided on the two plates 12, 14, column 4, lines 54-57) for applying DC electric fields to said liquid crystal material (controlled electric field, column 4, line 56, positive pulse of voltage, application of another identical voltage of the same polarity, column 10, lines 60-65), a first of the fields having a magnitude, a first direction and duration to cause the liquid crystal to have a first stable optical state (positive pulse to pass into state B, column 10, lines 55-63), a second of the fields having a magnitude, second direction and duration to cause the liquid crystal to have a second stable optical state (negative pulse flips the system into state A, column 10, lines 66-67), the first and

second directions being opposite to each other (positive pulse, negative pulse, column 10, lines 55-68), the first and second stable optical states differing from each other (two stable textures corresponding to different flexoelectric polarizations, column 10, lines 55-60). Durand fails to teach that the liquid crystal material has finely divided solid particles dispersed therein, wherein the solid particles have sizes in the range of 1 to 500 nm.

However, Eidenschink teaches a bistable liquid crystal display device (generating bistable images, column 2, lines 7-10, liquid crystalline medium in a display, column 2, lines 23-29) comprising nematic liquid crystal material (phase, column 7, lines 34-36) and finely divided solid particles dispersed therein (highly disperse metal oxides by Aerosil, Degussa, aluminum oxide, titanium oxide, column 4, lines 53-60) having a particle size of 12 nm (column 6, lines 54-55) and 16 nm (column 7, lines 9-10), which are within the claimed range of 1 to 500 nm. Eidenschink teaches that the composition provides bistability of the transparent and the scattering state for nematic liquid crystal (column 2, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the nematic liquid crystal material with finely divided solid particles dispersed therein, having a size in the range of 1 to 500 nm, in order to provide bistability of the transparent and the scattering state for the nematic liquid crystal composition of Durand, as taught by Eidenschink.

6. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durand in view of Eidenschink as applied to claims 1-6, 9-16 above, and further in view of Bryan-Brown (US 6,549,256).

Regarding claim 7, Durand in view of Eidenschink, has been discussed above, and fails to teach that said first surface alignment induces planar alignment and said second surface alignment induces homeotropic alignment.

However, Bryan-Brown teaches a liquid crystal display device comprising two cell walls enclosing a layer of nematic liquid crystal material (abstract), wherein a first surface alignment on an inner surface of one of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a first orientation, induces planar alignment and a second surface alignment on an inner surface of the other of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a second orientation, induces homeotropic alignment (an aligning surface treatment at one cell wall providing substantially planar alignment, an aligning surface treatment on the second cell wall capable of providing a substantially homeotropic alignment, column 2, lines 21-28), for the purpose of obtaining a controlled twist device with improved viewing angle (column 2, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a first surface alignment which induces planar alignment, and a second surface alignment which induces homeotropic alignment, as the first and second surface alignments in the liquid crystal display device

of Durand in view of Eidenschink, in order to obtain a controlled twist device with improved viewing angle, as taught by Bryan-Brown.

Regarding claim 8, Durand also teaches that an embodiment in which said surface alignments induce planar alignment at an angle to each other (symmetric situation in which the directions are coplanar, one direction is rotated by 45 degrees, column 7, lines 28-35). Durand in view of Eidenschink fails to teach that the angle is at substantially 90 degrees.

However, Bryan-Brown teaches that first and second alignment directions are at an angle of substantially 90 degrees (approximately orthogonal, abstract), for the purpose of obtaining a controlled twist device with improved viewing angle (column 2, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a first surface alignment which induces planar alignment, and a second surface alignment which induces homeotropic alignment, as the first and second surface alignments in the liquid crystal display device of Durand in view of Eidenschink, in order to obtain a controlled twist device with improved viewing angle, as taught by Bryan-Brown.

Allowable Subject Matter

7. Claims 17-27 are allowed. The closest prior art of record US 5,357,358 fails to teach or suggest, even in view of US 6,515,649, US5,29,320, US 6,549,256, the combinations recited by independent claims 17, 26, 27. None of the references teach that the liquid crystal material is induced to adopt first and second orientations by application of a DC pulse for causing at least some of the particles to migrate to first and second surface alignments.

Response to Arguments

8. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon.
Sow-Fun Hon
06/30/06

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772
7/3/06